# Natural Resources Management Major

## Major Requirements

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Degree Type: B.S.
Minimum Credits Required: 120
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### University Degree Requirements

For complete details on these and other university degree requirements, refer to the Degree and Graduation Requirements (http://catalog.ndsu.edu/academic-policies/undergraduate-policies/degree-and-graduation/) section in the University Catalog.

1. Minimum of 120 semester credits (some programs may exceed this minimum).
2. Complete the University General Education requirements.
3. Minimum institutional GPA of 2.00 based on work taken at NDSU.
4. Minimum of 30 credits in resident at NDSU.
5. Minimum of 36 upper level credits (courses numbered 300 or higher).
6. Students with transfer credit must meet the NDSU 30 credits in residence (#4). Of these 30 credits in residence, a minimum of 15 credits must be in courses numbered 300 or above, and 15 credits must be in the student's declared major curricula.

### University General Education Requirements

A list of university approved general education courses along with the administrative policies governing the requirement and the categories is available here (http://catalog.ndsu.edu/academic-policies/undergraduate-policies/general-education/).

| Code | Title | Credits |
|---|---|---|
| **Category C: Communication** | | **12** |
| **Category R: Quantitative Reasoning** | | **3** |
| **Category S: Science and Technology** | | **10** |
| **Category A: Humanities and Fine Arts** | | **6** |
| **Category B: Social and Behavioral Sciences** | | **6** |
| **Category W: Wellness** | | **2** |
| **Category D: Cultural Diversity** | | |
| **Category G: Global Perspectives** | | |
| **Category L: Digital Literacy** | | |
| **Total Credits** | | **39** |

### MAJOR REQUIREMENTS

| Code | Title | Credits |
|---|---|---|
| **Core Requirements** | | |
| BIOL 150<br>& 150L | General Biology I<br>and General Biology I Laboratory | 4 |
| BIOL 151<br>& 151L | General Biology II<br>and General Biology II Laboratory | 4 |
| CHEM 121<br>& 121L | General Chemistry I<br>and General Chemistry I Laboratory | 4 |
| ECON 201 | Principles of Microeconomics (May satisfy general education category B and G) | 3 |
| ENGL 321 | Writing in the Technical Professions | 3 |
| or ENGL 324 | Writing in the Sciences | |
| or ENGL 459 | Researching and Writing Grants and Proposal | |
| ENT 210 | Insects, Humans and the Environment | 3 |
| PHIL 215 | Contemporary Moral Issues (May satisfy general education category A) | 3 |
| or PHIL 225 | Environmental Ethics | |
| MATH 103 | College Algebra | 3 |
| NRM 150 | Natural Resource Management Orientation | 1 |
| NRM 225 | Natural Resources & Agrosystems | 3 |

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| NRM 421 | Environmental Outreach Methods | 3 |
| NRM/RNG/SOIL 462 | Natural Resource and Rangeland Planning | 3 |
| RNG 136 | Introduction to Range Management | 3 |
| RNG 213 | Rangeland Sampling Techniques | 3 |
| RNG 452 | Managing Natural and Rangeland Resources using GIS | 3 |
| EMGT, POLS, or SOC Elective | | 3 |
| SOIL 210 | Introduction to Soil Science | 3 |
| STAT 330 | Introductory Statistics | 3 |
| Emphasis: Students must select one of the NRM emphasis areas listed below to complete the major requirements. | | 45-50 |
| **Total Credits** | | **100-105** |

**NATURAL RESOURCES MANAGEMENT EMPHASIS AREAS**

- Declaring an Emphasis- Students should formally declare an emphasis area with the **Office of Registration & Records** no later than the beginning of their junior year. The emphasis area is recorded on the academic transcript with the degree.

## Water, Habitat, and Environmental Management Emphasis

| Code | Title | Credits |
|---|---|---|
| BIOL 364 | General Ecology | 3 |
| BIOL 475 | Conservation Biology | 3 |
| or BIOL 476 | Wildlife Ecology and Management | |
| ECON 481 | Natural Resource Economics | 3 |
| NRM 264 | Natural Resource Management Systems | 3 |
| NRM 402 | River and Stream Resource Management | 3 |
| or NRM 454 | Wetland Resources Management | |
| or SOIL 410 | Soils and Land Use | |
| NRM 431 | National Environmental Policy Act and Environmental Impact Assessment | 3 |
| NRM 453 | Rangeland Resources Watershed Management | 3 |
| Select a minimum of 29 credits from the approved electives below: | | 29 |
| BIOL 359 | Evolution | |
| BIOL 414 | Plant Systematics | |
| BIOL 450 | Invertebrate Zoology | |
| BIOL 452 | Ichthyology | |
| BIOL 454 | Herpetology | |
| BIOL 456 | Ornithology | |
| BIOL 458 | Mammalogy | |
| BIOL 460 | Animal Physiology | |
| BIOL 461 | Plant Ecology | |
| BIOL 462 | Physiological Ecology | |
| BIOL 463 | Animal Behavior | |
| BIOL 472 | Structure and Diversity of Plants and Fungi | |
| BIOL 477 | Wildlife and Fisheries Management Techniques | |
| BIOL 480 | Ecotoxicology | |
| BIOL 481 | Wetland Science | |
| ENT 350 | General Entomology | |
| MICR 202 & 202L | Introductory Microbiology and Introductory Microbiology Lab | |
| NRM 401 | Urban-Ecosystem Management | |
| NRM 420 | Sustainable Scenarios in Natural Resources Management | |
| PLSC 219 | Introduction to Prairie & Community Forestry | |
| PLSC 315 | Genetics | |
| PLSC 315L | Genetics Laboratory | |
| PLSC 323 | Principles of Weed Science | |
| PLSC 355 | Woody Landscape Plants | |

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| RNG 451 | Fire Ecology and Rangeland Management |
| RNG 456 | Ecological Restoration |
| RNG 458 | Grazing Ecology and Rangeland Management |
| RNG 450 | Range Plants |
| SOIL 217 | Introduction to Meteorology & Climatology |
| SOIL 351 | Soil Ecology |
| SOIL 410 | Soils and Land Use |
| SOIL 433 | Soil Ecohydrology and Physics |
| SOIL 444 | Soil Genesis and Survey |
| **Total Credits** | **50** |

## *Environmental Sustainability, Outreach, and Policy Emphasis*

| Code | Title | Credits |
|---|---|---|
| BIOL 364 | General Ecology | 3 |
| ECON 481 | Natural Resource Economics | 3 |
| NRM 401 | Urban-Ecosystem Management | 3 |
| NRM 420 | Sustainable Scenarios in Natural Resources Management | 3 |
| NRM 431 | National Environmental Policy Act and Environmental Impact Assessment | 3 |
| POLS, SOC or EMGT | 200 level or higher | 6 |
| Select a minimum of 29 credits from the approved electives listed below: | | 29 |
| BIOL 461 | Plant Ecology | |
| COMM 112 | Understanding Media and Social Change | |
| COMM 133 | Introduction to Agricultural Communication | |
| COMM 316 | Conflict Communication | |
| ECON 482 | Environmental Economics | |
| EMGT 101 | | |
| EMGT 281 | | |
| EMGT 361 | | |
| EMGT 362 | | |
| EMGT 363 | | |
| EMGT 410 | | |
| ENT 350 | General Entomology | |
| GEOL 201 | Climate Change and Energy | |
| GEOL 219 | Oceanography | |
| GEOL 300 | Environmental Geology | |
| GEOL 412 | Geomorphology | |
| GEOL 414 | Hydrogeology | |
| GEOL 460 | Biogeochemistry | |
| GEOG 470 | Remote Sensing | |
| NRM 322 | Environmental Law and Policy | |
| NRM 453 | Rangeland Resources Watershed Management | |
| PLSC 110 | World Food Crops | |
| PLSC 219 | Introduction to Prairie & Community Forestry | |
| POLS 115 | American Government | |
| POLS 215 | Problems and Policies In American Government | |
| POLS 442 | Global Policy Issues | |
| RNG 451 | Fire Ecology and Rangeland Management | |
| RNG 456 | Ecological Restoration | |
| RNG 458 | Grazing Ecology and Rangeland Management | |
| SOC 110 | Introduction to Sociology | |
| SOC 115 | Social Problems | |
| SOC 340 | Social Research Methods | |

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| SOC 404 | Community Assessment |
| SOC 405 | Community Development |
| SOC 235 | Cultural Diversity |
| SOC 431 | Environmental Sociology |
| SOC 439 | Social Change |
| SOIL 217 | Introduction to Meteorology & Climatology |
| AGEC 347 | Principles of Real Estate |
| AGEC 242 | Introduction to Agricultural Management |
| AGEC 375 | Applied Agricultural Law |
| AGEC 452 | Food Laws and Regulations |
| AGEC 474 | Cooperatives |
| MATH 144 | Mathematics for Business |
| ECON 202 | Principles of Macroeconomics |
| ECON 341 | Intermediate Microeconomics |
| ECON 470 | Public Economics |
| GEOL 465 | Remote Sensing of the Environment |
| **Total Credits** | **50** |

## *Rangeland Ecology Emphasis*

| Code | Title | Credits |
|---|---|---|
| ANSC 114 | Introduction to Animal Sciences | 3 |
| BIOL 364 | General Ecology | 3 |
| BIOL 452 | Ichthyology | 3 |
| or BIOL 454 | Herpetology | |
| or BIOL 456 | Ornithology | |
| or BIOL 458 | Mammalogy | |
| BIOL 461 | Plant Ecology | 3 |
| BIOL 475 | Conservation Biology | 3 |
| or BIOL 476 | Wildlife Ecology and Management | |
| NRM 431 | National Environmental Policy Act and Environmental Impact Assessment | 3 |
| NRM 453 | Rangeland Resources Watershed Management | 3 |
| or NRM 454 | Wetland Resources Management | |
| PLSC 380 | Principles of Plant Physiology | 3 |
| RNG 450 | Range Plants | 3 |
| RNG 451 | Fire Ecology and Rangeland Management | 3 |
| RNG 456 | Ecological Restoration | 3 |
| RNG 458 | Grazing Ecology and Rangeland Management | 3 |
| SOIL 217 | Introduction to Meteorology & Climatology | 3 |
| SOIL 351 | Soil Ecology | 3 |
| or SOIL 410 | Soils and Land Use | |
| or SOIL 444 | Soil Genesis and Survey | |
| Select a minimum of 9 additional credits of 300 or 400 level courses from ENT, SOIL, RNG, or NRM: | | 9 |
| **Total Credits** | | **51** |

## *Rangeland Livestock Production Emphasis*

| Code | Title | Credits |
|---|---|---|
| ANSC 114 | Introduction to Animal Sciences | 3 |
| ANSC 220 | Livestock Production | 3 |
| ANSC 223 | Introduction to Animal Nutrition | 2 |
| ANSC 357 | Animal Genetics | 3 |
| NRM 431 | National Environmental Policy Act and Environmental Impact Assessment | 3 |
| PLSC 315 | Genetics | 3 |

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|---|---|---|
| PLSC 320 | Integrated Forage and Cover Crops Production Management and Ecosystem Services | 3 |
| PLSC 323 | Principles of Weed Science | 3 |
| RNG 450 | Range Plants | 3 |
| RNG 456 | Ecological Restoration | 3 |
| RNG 458 | Grazing Ecology and Rangeland Management | 3 |
| SOIL 217 | Introduction to Meteorology & Climatology | 3 |
| SOIL 351 | Soil Ecology | 3 |
| or SOIL 410 | Soils and Land Use | |
| or SOIL 444 | Soil Genesis and Survey | |
| Select a minimum of 9 additional credits of 300 or 400 level courses from ENT, SOIL, RNG, or NRM | | 9 |
| **Total Credits** | | **47** |

## *Soil Science Emphasis*

| Code | Title | Credits |
|---|---|---|
| CHEM 240 | Survey of Organic Chemistry | 3 |
| or BIOC 260 | Elements of Biochemistry | |
| or MICR 202 & 202L | Introductory Microbiology and Introductory Microbiology Lab | |
| GEOL 105 & 105L | Physical Geology and Physical Geology Lab | 4 |
| MATH 105 | Trigonometry | 3 |
| PHYS 211 & 211L | College Physics I and College Physics I Laboratory | 4 |
| PLSC 110 | World Food Crops | 3 |
| PLSC 225 | Principles of Crop Production (or 300/400 level Range Sciences Course ) | 3 |
| PLSC 380 | Principles of Plant Physiology | 3 |
| SOIL 217 | Introduction to Meteorology & Climatology | 3 |
| SOIL 322 | Soil Fertility and Fertilizers | 3 |
| SOIL 351 | Soil Ecology | 3 |
| SOIL 410 | Soils and Land Use | 3 |
| SOIL 433 | Soil Ecohydrology and Physics | 3 |
| SOIL 444 | Soil Genesis and Survey | 3 |
| SOIL/NRM 454 | Wetland Resources Management | 3 |
| Select a minimum of 6 additional credits of 300 or 400 level classes from PLSC, RNG, NRM, ENT, PPTH, ABEN, or ASM | | 6 |
| **Total Credits** | | **50** |

## *Entomology Emphasis*

| Code | Title | Credits |
|---|---|---|
| BIOL 364 | General Ecology | 3 |
| RNG 450 | Range Plants | 3 |
| or BIOL 461 | Plant Ecology | |
| or PLSC 380 | Principles of Plant Physiology | |
| BIOL 450 | Invertebrate Zoology | 3 |
| BIOL 475 | Conservation Biology | 3 |
| ENT 350 | General Entomology | 3 |
| ENT 431 | Principles of Insect Pest Management | 3 |
| ENT 470 | Insect Ecology | 3 |
| PLSC 110 | World Food Crops | 3 |
| Select a minimum of 6 credits of approved electives from below: | | 6 |
| PLSC 210 | Horticulture Science | |
| PLSC 219 | Introduction to Prairie & Community Forestry | |
| PLSC 315 | Genetics | |
| PLSC 323 | Principles of Weed Science | |

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|---|---|---|
| PLSC 350 | Sugarbeet Production | |
| PLSC 355 | Woody Landscape Plants | |
| PLSC 365 | Herbaceous Landscape Plants | |
| PLSC 370 | Landscape Management | |
| PLSC 375 | Turfgrass Management | |
| PLSC 412 | Nursery Production and Management | |
| PLSC 415 | Vegetable Crop Production | |
| PLSC 416 | Fruit Crop Production | |
| PLSC 422 | Greenhouse Production and Management | |
| PLSC 425 | Potato Science | |
| PLSC 431 | Intermediate Genetics | |
| PLSC 433 | Weed Biology and Ecology | |
| PLSC 455 | Cropping Systems:An Integrated Approach | |
| SOIL 351 | Soil Ecology | |
| Select a minimum of 15 credits from the approved electives listed below: | | 15 |
| BIOL 359 | Evolution | |
| BIOL 463 | Animal Behavior | |
| BIOL 476 | Wildlife Ecology and Management | |
| MICR 202 | Introductory Microbiology | |
| MICR 452 | Microbial Ecology | |
| MICR 463 | Clinical Parasitology | |
| NRM 401 | Urban-Ecosystem Management | |
| NRM 402 | River and Stream Resource Management | |
| NRM 420 | Sustainable Scenarios in Natural Resources Management | |
| NRM 431 | National Environmental Policy Act and Environmental Impact Assessment | |
| NRM 453 | Rangeland Resources Watershed Management | |
| NRM 454 | Wetland Resources Management | |
| PLSC 315 | Genetics | |
| PPTH 324 | Introductory Plant Pathology | |
| PPTH 454 | Diseases Of Field and Forage Crops | |
| PPTH 455 | Plant Disease Management | |
| PPTH 457 | Landscape Plant Pathology | |
| PPTH 460 | Fungal Biology | |
| RNG 450 | Range Plants | |
| SOIL 410 | Soils and Land Use | |
| **Total Credits** | | **45** |

### *Accelerated Program in Natural resource Management*

| Code | Title | Credits |
|---|---|---|
| NRM 621 | Environmental Outreach Methods | 3 |
| NRM 652 | Managing Natural and Rangeland Resources using GIS | 3 |
| NRM 662 | Natural Resource and Rangeland Planning | 3 |
| 600 Level Electives | NRM/RNG/SOIL/ENT [1] | 6 |
| Total Credits | | 15 |

[1] Accelerated Electives must be advisor approved and the specific courses are to be identified on the Accelerated Declaration form.

## Degree Requirements and Notes:

- **Acceptable Substitutions**: For the Water, Habitat, and Environmental Management; Environmental Sustainability, Outreach, and Policy; and Entomology emphasis areas there is a list of recommended emphasis electives: All other substitutions require advisor approval and a substitution form to be completed and submitted to the Office of Registration and Records (https://www.ndsu.edu/registrar/). Emphasis area courses may not be double-counted with the NRM core classes; a maximum of 3 credits of Field Experience (396/496) or Co-op Ed (397/497) may be counted as emphasis electives.

- **Accelerated Program in NRM Notes:**
  - If a student is interested in this option, they should speak with their Undergraduate Advisor. Students intending to pursue the Accelerated option will need a 3.0 overall GPA, as well as 60 completed credits (in-progress courses do not count). Students will be required to complete a ***Combined/Accelerated Program Declaration Form*** and apply to the Graduate School. Taking the GRE is not required.